

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-58. Canceled.

59. (Withdrawn) An apparatus for printing a multicolor composite image formed from at least two component images on a plurality of shaped pharmaceutical pieces each having at least one non-planar surface, said apparatus comprising:

a first print station effective to print a first component image on said at least one non-planar surface of said shaped pharmaceutical pieces at a first print position;

a second print station effective to print a subsequent second component image on said at least one non-planar surface of said shaped pharmaceutical pieces at a second print position; and

a transport surface to move said shaped pharmaceutical pieces from said first print position to said second print position, wherein said transport surface includes a plurality of transport recess portions,

wherein each of said shaped pharmaceutical pieces is removably positioned in a predetermined location temporarily fixed within a respective one of said transport recess portions at least between the first and second print positions, to thereby maintain registration of said first component image relative to said second component image so as to enable said multicolor composite image to be formed.

60. (Withdrawn) The apparatus of claim 59, wherein said transport recess portions are configured to position the non-planar surface of said pieces above said transporting surface.

61. (Withdrawn) The apparatus of claim 59, further including a retaining plate to move cooperatively with said transport surface to fix said shaped pharmaceutical pieces in said transport recess portions.

62. (Withdrawn) The apparatus of claim 59, wherein each of said transport recess portions includes an opening through which a retaining member extends to fix said shaped pharmaceutical pieces in said transport recess portions.

63. (Withdrawn) The apparatus of claim 59, wherein each of said transport recess portions includes a resilient portion, and a retaining member urges said pieces against said resilient portions.

64. (Withdrawn) The apparatus of claim 59, further comprising a plurality of retaining members each including a resilient portion configured to temporarily and selectively fix the shaped pharmaceutical pieces in the predetermined location.

65. (Withdrawn) The apparatus of claim 59, wherein said shaped pharmaceutical piece is one of a pharmaceutical capsule, tablet or caplet.

66. (Withdrawn) The apparatus of claim 59, wherein each of said transport recess portions includes at least one hole in communication with a vacuum source, to maintain the shaped pharmaceutical pieces in the predetermined location.

67. (Withdrawn) The apparatus of claim 66, wherein the vacuum source is configured to apply a first vacuum pressure in the vicinity of at least one of the first and second

print positions, and a second pressure, lower than the first vacuum pressure, between the first and second print stations.

68. (Withdrawn) The apparatus of claim 59, wherein the first and second print stations are ink jet printers configured to serially apply the first and second component images to the shaped pharmaceutical pieces.

69. (Withdrawn) The apparatus of claim 59, wherein registration between the first and second print positions for each of the shaped pharmaceutical pieces is maintained at better than or equal to 0.40 mm.

70. (Withdrawn) The apparatus of claim 69, wherein said registration is better than or equal to 0.25mm.

71. (Withdrawn) The apparatus of claim 70, wherein said registration is better than or equal to 0.05mm.

72. (Withdrawn) The apparatus of claim 59, wherein said transport surface is configured to have a production rate of at least 1,000 shaped pharmaceutical pieces per hour.

73. (Withdrawn) The apparatus of claim 72, wherein said transport surface is configured to have a production rate of at least 10,000 shaped pharmaceutical pieces per hour.

74. (Withdrawn) The apparatus of claim 73, wherein said transport surface is configured to have a production rate of at least 50,000 shaped pharmaceutical pieces per hour.

75. (Withdrawn) The apparatus of claim 59, wherein said shaped pharmaceutical pieces are prevented from skewing and yawing within the transport recess portions.

76. (Previously Presented) A method for printing a multicolor composite image formed from at least two component images on a plurality of shaped pharmaceutical pieces each having at least one non-planar surface, said method comprising:

printing a first component image on said at least one non-planar surface of said shaped pharmaceutical pieces at a first print position;

printing a subsequent second component image on said at least one non-planar surface of said shaped pharmaceutical pieces at a second print position;

moving a transport surface including said shaped pharmaceutical pieces from said first print position to said second print position, wherein said transport surface includes a plurality of transport recess portions; and

positioning said shaped pharmaceutical pieces in a predetermined location temporarily fixed within a respective one of said transport recess portions at least between the first and second print positions, to thereby maintain registration of said first component image relative to said second component image so as to enable said multicolor composite image to be formed.

77. (Previously Presented) The method of claim 76, wherein positioning of the shaped pharmaceutical pieces includes positioning the shaped pharmaceutical pieces in the transport recess portions such that the non-planar portion of each of the shaped pharmaceutical pieces protrudes above the transport surface.

78. (Previously Presented) The method of claim 76, further comprising positioning a vacuum hole at a deepest portion of each of the transport recess portions.

79. (Previously Presented) The method of claim 76, further comprising positioning a vacuum hole on a side wall of each of the transport recess portions.

80. (Previously Presented) The method of claim 76, further comprising applying a pressure differential to temporarily fix the shaped pharmaceutical pieces in the predetermined location.

81. (Withdrawn) The apparatus of claim 66, wherein each said transport recess portion is symmetrical and each said hole is asymmetrically positioned within each said transport recess portion.

82. (Withdrawn) The apparatus of claim 66, wherein each said transport recess portion includes at least two holes in communication with the vacuum source.

83. (Withdrawn) The apparatus of claim 82, wherein said at least two holes are located in a base portion of each said transport recess portion.

84. (Withdrawn) The apparatus of claim 82, wherein a first of said holes is positioned at a deepest portion of each said transport recess portion, and a second of the two holes is positioned along an inclined trailing wall portion of each said transport recess portion.

85. (Withdrawn) The apparatus of claim 66, wherein the hole is positioned within an inclined trailing wall of each said transport recess portion.

86. (Withdrawn) The apparatus of claim 85, wherein a leading end of each said transport recess portion includes a leading wall portion.

87. (Withdrawn) The apparatus of claim 86, wherein each said leading wall portion is more gradually inclined than the inclined trailing wall.

88. (Withdrawn) The apparatus of claim 59, wherein the transport surface includes a plurality of carrier bars arranged to form an endless loop defining at least one inclined ramp section, and a feed hopper positioned along said inclined ramp section.

89. (Withdrawn) The apparatus of claim 59, further comprising a plenum chamber provided beneath the transport surface and extending from at least the first print station to the second print station, and a vacuum source in communication with the plenum chamber.

90. (Withdrawn) The apparatus of claim 89, wherein the plenum chamber includes at least two plenum dividers extending along a transport direction of the transport surface, to define plenum subchambers.

91. (Withdrawn) The apparatus of claim 90, further including an opening in at least one of the plenum dividers to communicate selective ones of said plenum subchambers.

92. (Withdrawn) The apparatus of claim 90, further comprising a slide element positioned between a bottom surface of the transport surface and each said plenum divider.

93. (Withdrawn) The apparatus of claim 90, wherein the plenum dividers are positioned between the first and second print units.

94. (Withdrawn) The apparatus of claim 89, wherein the plenum chamber includes a base having at least one opening in communication with the vacuum source.

95. (Withdrawn) The apparatus of claim 59, further comprising a first plenum chamber associated with the first print unit and a second plenum chamber associated with the second print unit, each of the first and second plenum chambers being in communication with a source of vacuum pressure, each of the transport recess portions being in communication with the source via at least one vacuum hole.

96. (Withdrawn) The apparatus of claim 95, further comprising a third plenum chamber positioned between the first and second chambers.

97. (Withdrawn) The apparatus of claim 96, wherein the third plenum chamber includes subchambers defined by at least one longitudinal divider, and the first and second plenum chambers extend along an entire width of the transport surface without plenum subchambers.

98. (Withdrawn) The apparatus of claim 96, wherein the first and second plenum chambers are associated with a first pressure differential, and the third plenum chamber is associated with the second pressure differential that is lower than the first pressure differential.

99. (Withdrawn) The apparatus of claim 95, wherein each of the first and second plenum chambers has a width approximately equal to or less than a width of a carrier bar forming a portion of the transport surface.

100. (Withdrawn) The apparatus of claim 59, wherein the transport surface includes a plurality of carrier bars forming an endless loop, each said carrier bar including a plurality of said transport recess portions, and further comprising a plenum chamber provided beneath the transport surface and in communication with a vacuum source, said plenum chamber including at least one divider that defines plenum subchambers equal in number to the plurality of said transport recess portions.

101. (Previously Presented) The method of claim 76, further comprising forming each said transport recess portion with a generally symmetrical pocket, and asymmetrically positioning at least one vacuum hole within a base portion of each said pocket.

102. (Previously Presented) The method of claim 76, further comprising providing each said transport recess portion with at least first and second vacuum holes in communication with the vacuum source.

103. (Previously Presented) The method of claim 102, further comprising positioning each said first vacuum hole at a deepest portion of each said transport recess portion, and positioning each said second vacuum hole along an inclined trailing wall of each said transport recess portion.

104. (Previously Presented) The method of claim 76, further comprising providing each said transport recess portion with a vacuum hole positioned along an inclined trailing wall of each said transport recess portion.

105. (Previously Presented) The method of claim 80, wherein the applying comprises applying a relatively higher pressure differential at the first and second positions and applying a relatively lower pressure differential between the first and second print positions.

106. (New) An apparatus for printing a multicolor composite image formed from at least two component images on a plurality of shaped pharmaceutical pieces each having at least one non-planar surface, said apparatus comprising:

means for printing a first component image on said at least one non-planar surface of said shaped pharmaceutical pieces at a first print position;

means for printing a subsequent second component image on said at least one non-planar surface of said shaped pharmaceutical pieces at a second print position;

means for moving a transport surface including said shaped pharmaceutical pieces from said first print position to said second print position, wherein said transport surface includes a plurality of transport recess portions; and

means for positioning said shaped pharmaceutical pieces in a predetermined location temporarily fixed within a respective one of said transport recess portions at least between the first and second print positions, to thereby maintain registration of said first component image relative to said second component image so as to enable said multicolor composite image to be formed.

107. (New) The method of claim 76, further comprising arranging a plurality of carrier bars to form an endless loop defining at least one inclined ramp section, and positioning a feed hopper along said inclined ramp section.

108. (New) The method of claim 59, further comprising providing a plenum chamber beneath the transport surface extending from at least the first print station to the second print station, and communicating a vacuum source with the plenum chamber.

109. (New) The method of claim 108, further comprising dividing the plenum chamber with at least one divider along a transport direction of the transport surface, to define plenum subchambers.

110. (New) The method of claim 109, further including providing an opening in at least one of the plenum dividers to communicate selective ones of said plenum subchambers.

111. (New) The method of claim 109, further comprising positioning a slide element between a bottom surface of the transport surface and each said plenum divider.

112. (New) The method of claim 109, further comprising positioning each said plenum divider between the first and second print units.

113. (New) The method of claim 108, further comprising providing the plenum chamber with a base having at least one opening in communication with the vacuum source.

114. (New) The method of claim 76, further comprising providing a first plenum chamber associated with the first print unit and a second plenum chamber associated with the second print unit, communicating each of the first and second plenum chambers with a source of vacuum pressure, and communicating each of the transport recess portions with the source via at least one vacuum hole.

115. (New) The method of claim 114, further comprising positioning a third plenum chamber between the first and second chambers.

116. (New) The method of claim 115, further comprising providing the third plenum chamber with subchambers defined by at least one longitudinal divider, and extending the first and second plenum chambers along an entire width of the transport surface without plenum subchambers.

117. (New) The method of claim 114, further comprising dimensioning each of the first and second plenum chambers to have a width approximately equal to or less than a width of a carrier bar forming a portion of the transport surface.

118. (New) The method of claim 76, further comprising constructing the transport surface to include a plurality of carrier bars forming an endless loop, each said carrier bar including a plurality of said transport recess portions;

providing a plenum chamber beneath the transport surface and in communication with a vacuum source; and

dividing said plenum chamber including at least one divider that defines plenum subchambers equal in number to the plurality of said transport recess portions.